



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/519,857

08/15/2005

Eiji Atsumi

885A.0005.U1(US)

9280

29683 7590 08/20/2008
HARRINGTON & SMITH, PC
4 RESEARCH DRIVE
SHELTON, CT 06484-6212

EXAMINER

THOMAS, MIA M

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

08/20/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/519,857	Applicant(s) ATSUMI ET AL.	
	Examiner Mia M. Thomas	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 9-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 9-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to applicant's remarks received on 28 April 2008. Claims 1-4 have been amended. Claims 5-8 have been cancelled. Claims 9-11 have been added. Support for the amendments can be found at least in paragraphs [0049] through [0053] of the published application. No new matter has been added. See the complete detailed response below.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2, 3, 9 are 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. The term "more complicated" at claim 2, line 14 for example, is a relative term which renders the claim indefinite. The term "more complicated" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. At paragraph [0054], the applicant discusses "the interpolation process that requires a more complicated operation, an increased amount of operational processing and a greater amount of

Art Unit: 2624

processing line memory can be employed as another interpolation method." The Examiner is uncertain as to how to measure the level of complexity of each algorithm with respect to the arbitrary color interpolation and the removed interpolation step (as disclosed at claim 2). Does the number of variables determine the complexity of the arbitrary image quality correction process or is it the processing speed in which the camera DSP must perform to get maximum complexity for the arbitrary image quality correction process?

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
7. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tariki et al (US 5,861,917) in combination with Zhang (US 7,116,819)

Regarding Claim 1: (Currently Amended) Tariki teaches ~~An information terminal apparatus, including data operation processing means for performing operation processing for input image data and preparing output image data, characterized by comprising:~~ (Refer to FIGS. 2; further, "An image pickup apparatus in accordance with the present invention will be described below with respect to embodiments thereof with reference to the accompanying drawings. An electronic zooming function will first be described with reference to FIGS. 2 through 4." at column 3, line 6);

a processor configured to perform first interpolation processing steps on input image data so as to prepare a first output image data ("In an image pickup apparatus having an electronic

Art Unit: 2624

zooming function for enlarging and interpolating an image by electronic image processing of an image pickup signal output from an image pickup device..." at abstract); ~~removal means, for removing, from the output image data, a retrieval module configured to intermittently remove at least a part or all of interpolation processing preformed in the steps of an operational processing sequence performed for first interpolation processing steps from the first output image data~~ (Refer to column 3, line 62-column 4, line 21);

Tariki does not specifically/expressly teach a second interpolation process. However, Zhang teaches and ~~the data processing means, for performing other operational processor further configured to perform at least one of a second interpolation processing steps for step on data obtained by in the removal process the removal means and for preparing so as to prepare a second output image data~~ (Refer to Figure 1, numeral 12; "The low-pass filter 2 removes frequency components whose frequency is equal to or higher than a $1/2$ of sampling frequency f_s ." at column 10, line 11).

Tariki and Zhang are combinable because they are in the same field of image transformation and color correction, specifically interpolation.

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to utilize a second interpolation process in a removal process.

The motivation/suggestion for doing so would have been "wherein the second interpolation section interpolates missing components by arithmetically processing the RGB image data using a filter having a size of an even-number of pixels." at column 7, line 48 (Zhang)

Therefore, it would have been obvious to the skilled artisan to combine the teachings of Tariki with the teachings of Zhang to obtain the specified claimed elements of Claim 1.

Regarding Claim 4: (Currently Amended) Claim 4 has claimed subject matter that equally resembles Claim 1. Claim 4 is the claimed method steps in equivalence with the claimed apparatus of Claim 1. Claim 4 is rejected for the same reasons, motivation and rationale as rejected above at Claim 1.

8. Claim 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tariki et al (US 5,861,917) in combination with Zhang (US 7,116,819) and further in view of Motta (US 6,650,795) in combination with Okada (US 6,977,683) and Nabeshima (US 6,999,197).

Regarding Claim 2: (Currently Amended-As *best understood by the Examiner*)

Tariki in combination with Zhang teaches/discloses all the claimed elements as rejected above. Tariki in combination with Zhang does not expressly disclose/teach the claimed elements of Claim 2, however, Motta, Okada and Nabeshima in combination or by way of simple substitution teaches/discloses the following claimed elements:

Motta teaches: a camera module including a lens (Refer to Figure 3, numeral 16-"Lens"), an image sensor (Refer to Figure 3, numeral 18-"CCD/Color Image Sensor") and a camera DSP (Refer to Figure 3, numeral 26-DSP/"Digital Signal Processing Circuit"), ~~and characterized in that:~~ wherein the camera DSP includes a color ~~correction means~~-corrector (Refer to Figure 3,

Art Unit: 2624

numeral 26; "The DSP 26 (FIG. 3) processes the digital signals from the A/D converter 24 so as to provide a demosaic function, and also performs automatic white balance detection and correction.." at column 4, line 26), wherein the camera module produces the ~~input-first output~~ image data; ("Referring again to FIG. 3, the portions of the camera 10 represented by the elements 22, 24, 26, 28 and 36 process the output signals from the image sensor as pictures are taken in succession to generate sets of pixels representative of a plurality of images of objects or scenes of interest." at column 4, line 59);

Okada teaches: a gamma correction-means corrector, ("...and gamma correction..." at column 3, line 13), a color interpolation-means interpolator ("For example, note at Figure 4, see beneath the arrow that states-"Color Separation and Interpolation"—Specifically, see Figure 7-"Filter Alignment Data"),

wherein the ~~removal-means removes an interpolation process by performing an-retrial module performs intermittent process-for-processing steps on pixels~~ that are interpolated by the color ~~correction-means~~-corrector of the camera DSP ("The present invention was created in consideration of these technical issues. Its object is to reduce the load on the recording medium data storage capacity and to provide a digital camera in which the user can perform pixel data interpolation regarding the image data." at column 2, line 13),

~~minimizes-so as to minimize~~ affects due to a color correction process and an image quality correction process that are performed by the camera DSP (Refer to column 5, line 23);

(Refer to Figure 9, numeral S49-The compression of the color correction process as performed above at step S43, S49 minimizes the affects of the processing that occurs at the previously steps of Figure 9), and ~~again-performs-the processor further configured to perform~~ an arbitrary color interpolation ~~process-processing step~~ (Refer to Figure 9, numeral S53) and an arbitrary

Art Unit: 2624

image quality correction ~~process~~ step that are more complicated than the removed interpolation step ("Through this processing, the R, G and B complete pixel data created in the digital camera 41 is reproduced (S52) and the image may be displayed." at column 7, line 32. For clarity, as explained above, since the image display is the LCD display unit-numeral 12, it does not pose any problems for the quality of the displayed image.).

Nabeshima teaches and an image quality correction means corrector ("The analog signals output from the CCD 114 are sent to the image processing device 115. The image processing device 115 converts the analog signals into digital data and performs such image processing as magnification change and image quality correction." at column 4, line 16)

Tariki, Zhang, Motta, Okada and Nabeshima are combinable because they are in the same field of image transformation and interpolation.

At the time that the invention was made, it would have been obvious to one of ordinary skill in the utilize a camera module including a lens, an image sensor and a camera DSP.

The suggestion/motivation for doing so would have been "The DSP 26 (FIG. 3) processes the digital signals from the A/D converter 24 so as to provide a demosaic function, and also performs automatic white balance detection and correction, as well as image sharpening functions in accordance with well known techniques." at column 4, line 26 (Okada).

Also the simple substitution of *white balance adjustment* for *color correction means* would yield the same results to one of ordinary skill in the art. The substitution of white balance

Art Unit: 2624

adjustment for color correction means would have also been an obvious substitution because the prior art contains elements that do not differ in scope and the substitution of these elements have the same well known function and are also well known in the art.

Okada exemplifies a diagrammatic explanation of these claimed elements and although Motta may inherently possess the characteristics of "camera DSP", "the camera module" and "removal means", the illustrations of Okada as set forth in this rejection shown diagrammatically at each claimed element the description of these elements.

While Motta, Okada and Nabeshima can be combined, the prior art elements according to the known methods of an "apparatus" having a camera module with a camera DSP and an image sensor with interpolation and removal means would yield predictable results through this combination of Motta, Okada and Nabeshima.

All the claimed elements have no change in their respective functions and the combination of Tariki, Zhang, Motta, Okada and Nabeshima would have yielded predictable results to one of ordinary skill in the art at the same time of the invention.

Regarding Claim 3: (Currently Amended) Zhang teaches the ~~removal means identifies retrieval~~ module is further configured to recognize an arrangement pattern for color filters that are laid on the image sensor ("FIG. 18 is a block diagram showing a third exemplary structure of a conventional image processing apparatus. In FIG. 18, the image processing apparatus 300 includes a primary-color CCD area sensor 301, RGB interpolation sections 302, a middle-range

Art Unit: 2624

component emphasizing section 303, a high-range component emphasizing section 304, a white balance adjustment section 305, and a gamma correction section 306. The primary-color CCD area sensor 301 includes a color filter of Bayer array." at column 3, line 57),

to separate color elements of pixels generated during the first interpolation ~~process~~ processing steps from color elements of pixels used to produce those color elements (Refer to Figure 18, numeral 302);

and to selectively ~~performs an~~ perform the intermittent ~~process~~ processing steps for the color elements of the pixels generated during the first interpolation ~~process~~ processing steps (Refer to Figure 16).

Regarding Claim 5 – 8: (Cancelled)

9. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tariki et al (US 5,861,917) in combination with Zhang (US 7,116,819) and further in view of Okada (US 6,977,683) and Nabeshima (US 6,999,197).

Regarding Claim 9: (New-As best understood by the Examiner) Okada teaches The method of claim 4, wherein the intermittent processes comprise a process performed on pixels that are interpolated by a color corrector ("The present invention was created in consideration of these technical issues. Its object is to reduce the load on the recording medium data storage capacity and to provide a digital camera in which the user can perform pixel data interpolation regarding the image data." at column 2, line 13),
so as to minimize affects due to a color correction process (Refer to column 5, line 23);

Art Unit: 2624

an image quality correction process that are performed by a camera DSP an arbitrary color interpolation process(Refer to Figure 9, numeral S53)

and an arbitrary image quality correction process that is more complicated than the removed interpolation step ("Through this processing, the R, G and B complete pixel data created in the digital camera 41 is reproduced (S52) and the image may be displayed." at column 7, line 32. For clarity, as explained above, since the image display is the LCD display unit-numeral 12, it does not pose any problems for the quality of the displayed image.).

Okada does not expressly teach an image quality corrector. However, Nabeshima teaches and an image quality ~~correction means~~ corrector ("The analog signals output from the CCD 114 are sent to the image processing device 115. The image processing device 115 converts the analog signals into digital data and performs such image processing as magnification change and image quality correction." at column 4, line 16.)

Okada and Nabeshima are combinable because they are in the same field of color correction and image transformation.

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to utilize an image quality corrector.

The suggestion/motivation for doing so would have been so that "The line-to-line correction unit 15 is a circuit that corrects the phase discrepancies among the R, G and B color image signals (data) that are caused due to the positional differences in the R, G and B lines of the CCD 114." as taught at column 4, line 60 (Nabeshima).

Art Unit: 2624

Therefore, at the time that the invention was made, it would have been obvious to combine the teachings of Okada and Nabeshima to obtain the specified claimed elements of Claim 9.

Regarding Claim 10: (New-As best understood by the Examiner) Zhang teaches The method of claim 9, wherein the performing intermittent processing further comprises recognizing an arrangement pattern for color filters that are laid on the image sensor ("FIG. 18 is a block diagram showing a third exemplary structure of a conventional image processing apparatus. In FIG. 18, the image processing apparatus 300 includes a primary-color CCD area sensor 301, RGB interpolation sections 302, a middle-range component emphasizing section 303, a high-range component emphasizing section 304, a white balance adjustment section 305, and a gamma correction section 306. The primary-color CCD area sensor 301 includes a color filter of Bayer array." at column 3, line 57), separating color elements of pixels generated during the first interpolation processes from color elements of pixels used to produce those color elements (Refer to Figure 1, also column 1, line 43 for example and selectively processing color elements of pixels generated during the first interpolation processes (Refer to Figure 1, numeral 4).

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tariki et al (US 5,861,917) in combination with Zhang (US 7,116,819) and further in view of Iwata (US 7,069,056 B2).

Regarding Claim 11: (New) Tariki and Zhang in combination teach/disclose all the claimed elements as rejected above. Tariki and Zhang in combination does not specifically disclose/teach an information terminal. However, Iwata teaches the apparatus of claim 1 embodied in an information terminal (Refer to abstract, title and specifically, "The present

Art Unit: 2624

invention relates to a mobile information terminal equipment, more particularly, to a mobile radio wave communication equipment, such as a mobile telephone, furnished with functions including electronic note, data communication, word processor, personal computer, and so on." at column 1, line 16).

Tariki, Zhang and lwata are combinable because they are in the same field of image processing using information terminal equipment.

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to utilize an information terminal.

The suggestion/motivation for doing so would have been "to achieve an easy-to-use mobile information terminal which also has multiple other functions." (see abstract, lwata)

Therefore, it have been obvious to one of ordinary skill in the art to combine the teachings of Tariki and Zhang with lwata to obtain the specified claimed elements of Claim 11.

Response to Arguments

11. Applicant's arguments, see page 5, with respect to 112 rejections have been fully considered and are persuasive. The rejection of Claim 1 under 35 USC 112, second paragraph has been withdrawn.

Art Unit: 2624

12. Applicant's arguments with respect to claim 1 have been fully considered and carefully reviewed but are moot in view of the new ground(s) of rejection. Further claims 2-3, 4, 9-11 also stand rejected (see rejections above.)

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is (571)270-1583. The examiner can normally be reached on Monday-Thursday 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2624

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mia M Thomas/
Examiner, Art Unit 2624

/Vikkram Bali/

Supervisory Patent Examiner, Art Unit 2624